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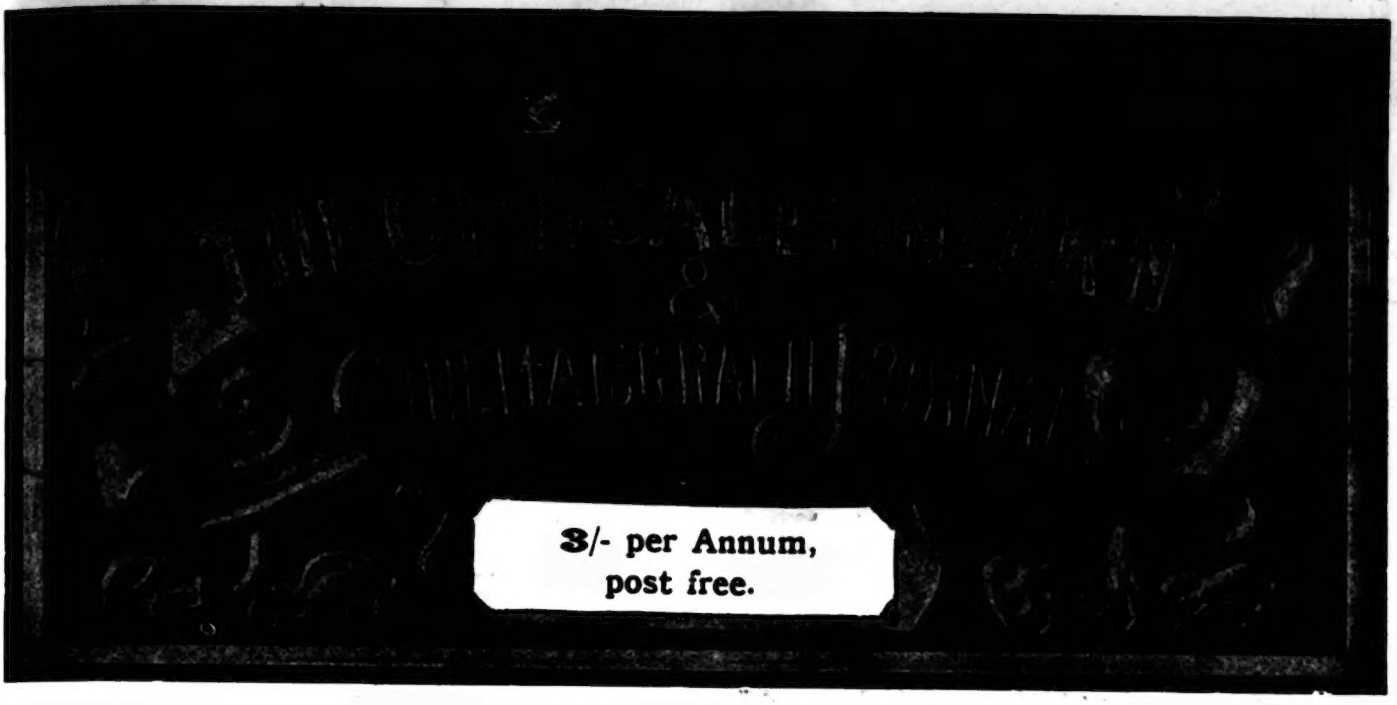

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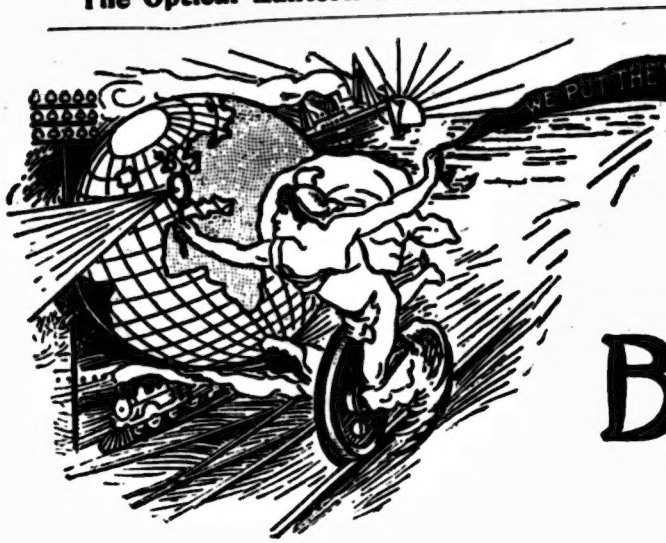

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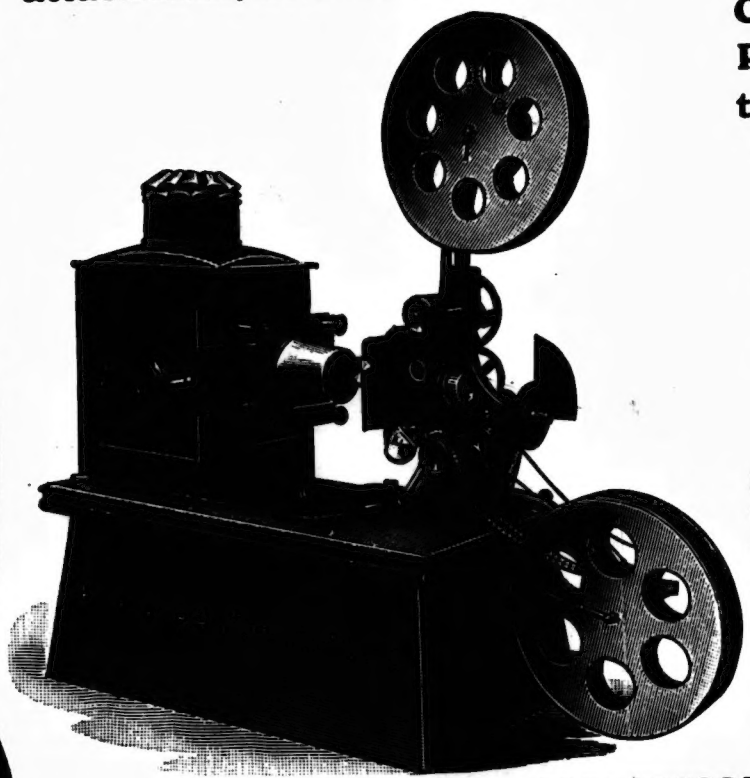

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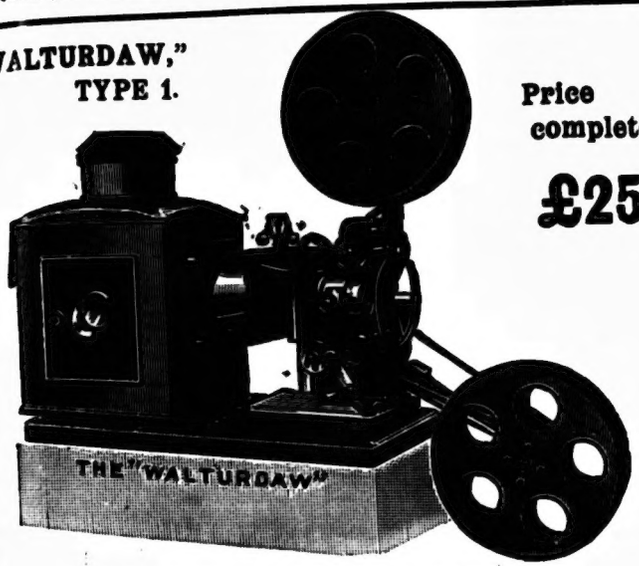

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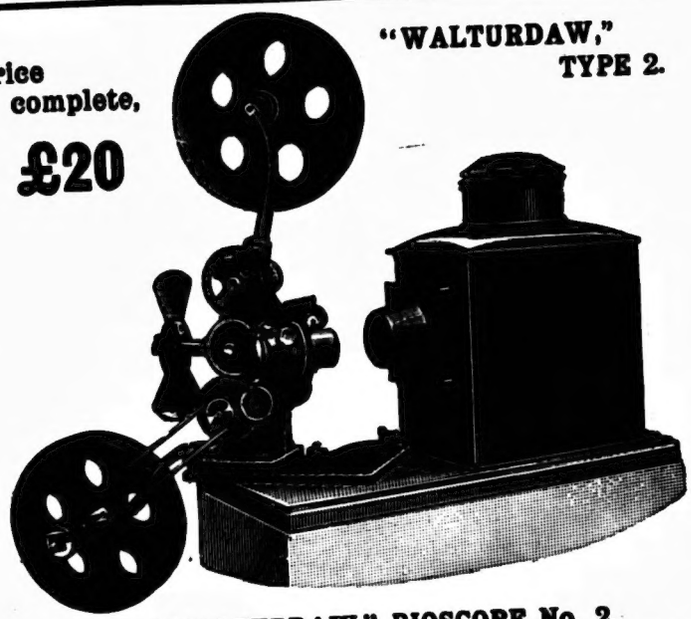

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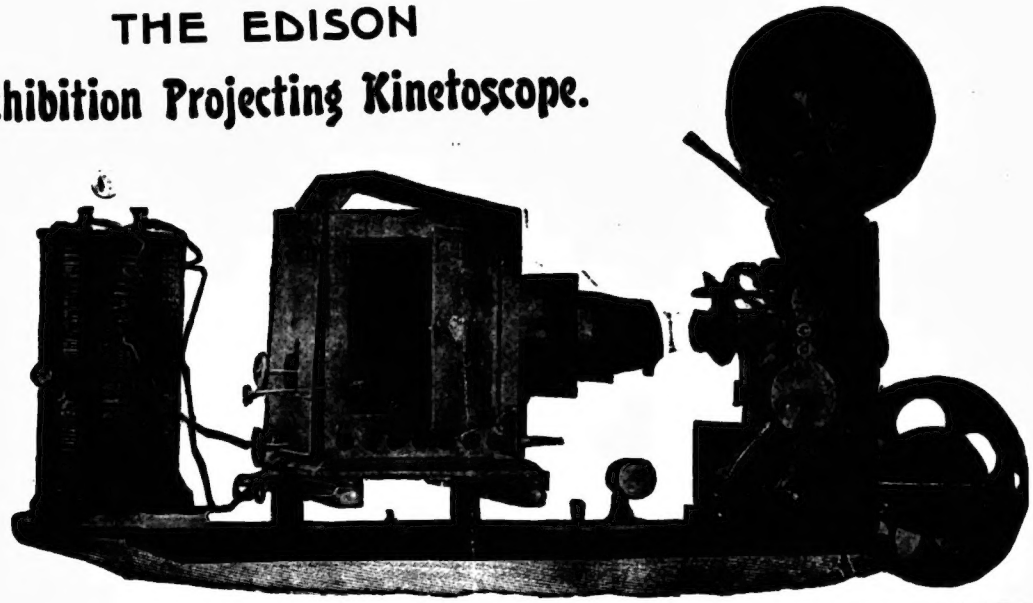

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Publishers.—Heron & Co., 9 & 11, Tottenham Street, W.
Telegrams, "Heronicus London."
Telephone, 4777 Gerrard.

Wholesale Agents.—F. Brett, 5, Pilgrim Street, E.C.
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THE bright days last month gave the camera man every chance for good films, but, as usual, he was full of trouble because very little of public interest took place. The boat race was rowed in quite unique weather, and some very good pictures were shown in consequence, but there was very little novelty for the screen in the race, and the chief attraction was to witness the reproduction on the evening of the event. After the first day, however, the spectators look upon the film as very ordinary, and it hardly seems worth the trouble and expense entailed. Many "notions," however, which had been arranged during the dark days, have been staged during the fine weather, and several good things of quite a novel nature are promised from various sources.

THE summer months will be the busiest that the living picture showman has yet experienced, for no *al fresco* entertainment of any pretention is now complete unless it has, as its *chef d'ouvre*, the all-important feature of a living picture display. Not only do the entertainment agents recognise its importance by making it a "star" turn in their already varied repertoires, but the managers of the huge concerns—such as the Alexandra Palace, the Crystal Palace, Wembley Park, numerous sports grounds and other of our open air resorts—have adopted this form of entertainment as *the* draw at their evening shows. Fireworks, although improved to such a degree that something new appeals to the spectators at each display, have not the old charm. They are much more expensive and always

seem a waste, besides being dirty and dangerous to their surroundings. The kinematograph has none of these discomforts. Hundreds can view the pictures without the terrific noise, the vile smelling smoke and the other disadvantages connected with pyrotechnics. As we have previously urged, it is the duty of the manufacturer and dealer to help forward anything which will make the industry a seasonable trade all the year round.

QUITE a feature of the Easter holiday carnivals was the number of booths at which living pictures were shown. At Hampstead Heath crowds flocked to the tents at which films were exhibited, and the showmen gathered a plentiful harvest. We should like to know whether the County Council restrictions were enforced at these temporary establishments, or if a little more license was granted.

As soon as this month's copy is in the printer's hands, we leave England on an extended tour in the United States and Canada, where we hope to obtain much information that will prove of interest and use to our numerous readers. On this trip we are taking full advantage of the opportunity of learning what is being done in the way of a manufactural combination and an operators' guild in other parts of the world, and hope to be able to bring new ideas to bear on the matter, so that arrangements can be made in this country to start each with a definite program at the commencement of the winter season.

SOME little time ago we published particulars of a new use to which the kinematograph was being put, namely, to exploit a patent bottling machine for which the inventor desired to form companies in the various countries in which it was patented. He invited promoters to witness films shewing the machinery in action, and this brilliant innovation gave an interest which had the desired effect, without the tremendous expense of erecting elaborate apparatus and carrying the same from place to place. Not only this, but the alluring prospectus—a costly but not always successful advocate—can now be dispensed with, and the more truthful photograph of the actual article soon impresses the manufacturer as to the merits or demerits of the innovation as a financial speculation.

ONCE again a wonderful vista of the future is opened before us by the intelligent application another financial genius has made of the lantern. The unknown beauties of a new paradise for those seeking health and beautiful scenery is now revealed by the aid of the camera. Were it not for the happy inspiration of the individual who discovered Porto Fino, which lies near Genoa, its unrivalled beauties might have lain dormant for many long years. Our friend, however, saw its attractions, and with a good moving picture camera recorded some of the most enchanting and delightful scenic pictures it has been our lot to witness. But it was with an eye to business that he embarked on the enterprise, for the possibilities of the promised land could faithfully be presented to those who desired profitable speculation. Thus a comparatively unknown elysium is made known not only to those who will treat it as a speculation, but also to the many worshippers of nature's magnificent bounty, who are for ever seeking new scenes of delight.

IT will not now be necessary for railway companies or land companies to boom such places with their flowery prospectuses bolstered up by editorial puffs. Such middlemen are entirely dispensed with, and brokers and other intermediaries will not garner in their wonted commissions. The kinematograph, the ever-truthful kinematograph, will definitely demonstrate facts which must convince, and at the same time advertise the true advantages of the newly-discovered El Dorado.

BRITISH MUSEUM

DURING the eighteen months that THE OPTICAL LANTERN AND KINEMATOGRAPH JOURNAL has been published, many letters have been received calling us to task for setting a bad example to the trade in the manner we have spelt kinematograph. Several correspondents have waxed highly indignant at the fact that, although they have troubled to point out the error, we have taken no notice of their protests, but persist in showing our ignorance of the derivation and proper spelling of the word. The fact is we have followed the practice of the "trade," and although in conversation our editorial lips (if the lips can be used in pronouncing K) have given the "hard" sound, yet our pen has persisted in following the custom in commencing with the "C."

WE now mean to reform, and to all and sundry declare that in future we mean to be correct and spell it with a "K." The Greek words, Kinema (motion) and Kineo (to move) are the words from which motion pictures have derived their title, and Kinematics is the science of true motion irrespective of the force producing them. But even authorities differ, for although Nuttall gives the above derivation, there is some question that there is such a word as "Kinema." In looking at Liddell and Scott's Lexicon (it is the condensed one, not the big edition) no such word is given. If there is such a word it would not mean motion, but something moved, as gramma in writing (*i.e.*, something written) from grapho. We do not say there is no such word in Greek, but think it not improbable that it is a word formed in English like mathematics from the Greek root matheo, from which there is a Greek word in use, "mathema," a thing learnt. We have heard many reasons why the word was corrupted, and the "C" took the place of "K." Perhaps our readers will also give us their views on the matter.

LAST month we referred to the injustice of blaming the kinematograph for truthfully depicting pictures of the Waterloo Cup. It is becoming a moot point as to whether it would be better to "tone down" events which those with too sensitive a nature find it necessary to take exception to. The following extract of a contemporary again draws attention to the question:—

"'The Resourceful Kinematograph' is the title of a series of reproductions published in our contemporary, the *Sketch*. These reproductions are from a kinematograph film issued by a French firm, and depict with considerable realism the incidents of the recent French mine disaster. The men are shown at work in the galleries, and the various phases of a miner's life are well represented. We think, however, that the line should be drawn at the portrayal of the effects of the explosion in the mine. Rescuers are shown at work among battered corpses, and bringing up dead bodies from the shafts. These pictures are, of course, 'fakes,' and have been specially posed and arranged for the kinematographer; but to pander to the morbid taste of those who like their illustrated news served in this form is likely to bring other productions of a clever instrument into disrepute."

A QUESTION, the pros and cons of which are open to much discussion, is exciting the "trade" at the present moment. It has always been a moot point whether public rights should outweigh certain monopolies. In other words, whether in the interests of the general public the camera man should have a free hand in obtaining pictures of leading events, or monopolists should be able to keep the sole rights of any of these special shows as their own preserves. At Earl's Court Exhibition sole rights of photo'ing or reproducing any of the Exhibition buildings is in the hands of one firm; at a recent public event, at Edinburgh, the sole rights of reproducing the ceremony was placed in the hands of one firm by the officials of the Corporation; the kinematograph rights for the Grand National and the recent Cup Tie at the Palace were again restricted to one firm. The argument has reached us that as such events are open to the general press, for the benefit of the general public, so the camera man should have free access and rights of reproduction. It is pointed out that the restriction to one firm or individual might be disastrous, as misfortune might prevent them from obtaining the best views, whereas if it were open to several, one out of the number might be fortunate enough to obtain good results. We shall have more to say on this matter in our next number.

CAN any of our readers elucidate the mystery as to who the aliens are mentioned in the following extract from *The Military Mail* of April 6th :—

. . . "The constructor went out of his way to injure Messrs. Gale and Polden, the proprietors of this Journal, on the day the 'Dreadnought' was launched. The constructor of the 'Dreadnought' knows it is laid down in King's Regulations that aliens are not allowed into Portsmouth Dockyard, yet on the day the 'Dreadnought' was launched he gave some aliens special facilities, such as a specially constructed enclosure, for taking photographs, although many British photographers, having special permits from the Admiralty, were not allowed to come within reasonable photographic distance of the ship."

This is a free country with a free press, and we trust more definite accusation will be made by the journalist who apparently has a personal grievance. "Some aliens" might apply to many in the trade, and the wisest plan for this new-found champion of British rights would be to bring a distinct charge against definite individuals instead of placing a stigma on the whole of the profession.

THE "EMPIRE" KINEMATOGRAPH.

We have on a previous occasion drawn attention to the technical details of Messrs. Butchers' celebrated machine, and, after a practical test under the most unfavourable circumstances, we endorse our previously expressed good opinion. Among the many projecting machines on the market, we feel certain the "Empire" will take a high position. It is well made, of the best material, has perfect solidity, is fitted with ball bearings throughout, which make it run easily, in fact, an operator might work it for an indefinite time without fatigue. The cut off is automatic, and made on the gyroscope principle, the shutter rising immediately the handle of machine is turned, and closing instantly the motion ceases. Every precaution is taken to ensure security against fire or any other catastrophe whilst the machine is in operation. A perfect eccentric centreing adjustment is also a special feature. It is not our intention to go into further details of mechanism, but we wish to convey to our readers the fact that the "Empire" is a kinematograph well worth the attention of the practical operator, designed and made under Messrs. Butchers' personal superintendence, and is the outcome of innumerable practical suggestions from experts. Every point has been carefully studied, with the result that a practicable, solid, well made, safe and easily worked machine has been produced at a most reasonable price. The firm will be glad at any time to show the machine, and convince the sceptical of the many good points of the "Empire" Kinematograph.

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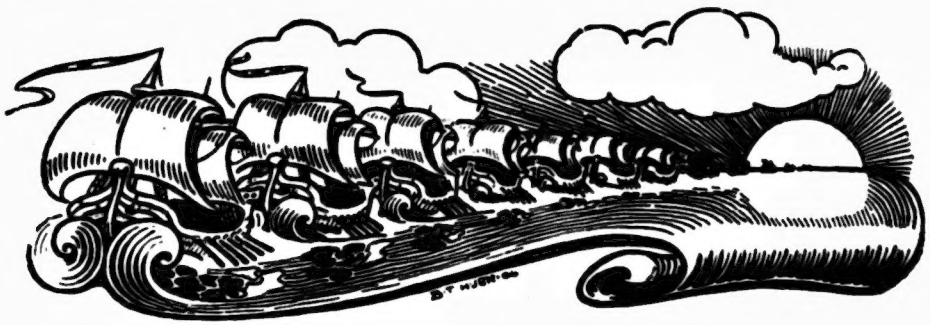


HOW I TAUGHT A PHOTOGRAPHIC PUPIL.

By Rev. T. Perkins.

A FEW months ago I received the following letter:—

"January 2nd, 1906.

"My Dear T. P.,

"It is long since you had a letter from me, and possibly might not have one now were it not that our old friend R., whom we used to see so much of in our Cambridge days, said that he had just heard a lecture you gave at C. on Amien's Cathedral illustrated by lantern slides from your own negatives. He was loud in his praise of these, and a local newspaper which he sent me endorsed his opinions. Now I have hitherto had a very busy life, with little time for anything but business, except a month's holiday in the summer, which I have generally spent in visiting the Cathedals, Abbeys, and Churches of Northern France; sometimes getting further afield, even as far as Venice. You remember how we in our younger days studied Ruskin and longed to see the original "stones of Venice," and how even then old buildings had a fascination for us. Well, to make a long story short, I have now no longer need to stick to the desk, and am a man at leisure; but without a hobby, a man's time hangs heavily on his hands. R.'s letter, telling me of your lecture, made me ask the question, why should I not take up photography, and apply it as you do? I had plenty of practice in speaking at the Cambridge Union, and was not unsuccessful there. I have studied architecture, so all that I want to make me a lecturer is the power of taking photographs and making slides. Can you give me any advice?—Yours sincerely, F.C."

To this I replied:—

"Turnworth,

"January 3rd, 1906.

"Dear F.C.,

"Glad indeed was I to get your letter. The results of my experience in matters photographic are entirely at your service. I have done much at this work, in its various applications, landscape, seascape, portraits, but especially architecture. You say you are in search of a hobby, you could not choose a better one than photography, I do not mean idle snapshottery and films developed and printed at the chemist's, but serious steady work, where selection of subject, exposure, development, and all the subsequent processes are entirely carried out by yourself. It gives you an object for days' or weeks' outings, you get exercise, you have something to show for your holiday, and the pleasure is not over when the holiday is, for there is the joy of the developing and printing; the making of slides gives you occupation in the long dark evenings of late autumn and winter, and the giving of lectures often leads to the making acquaintance with agreeable people. First, however, you will want some apparatus. If the main object is the making of slides, as I think yours will be, then you will not need a large camera; this is an advantage in many ways; you will not have a heavy load to cart about with you, and you will easily be able to carry a sufficient stock of plates for a day's work already placed in your dark slides, without having to look out for places in which to change plates. Get a square-bellows quarter-plate camera with a long extension, not less than 10 or 12 inches, and a couple or three anastigmatic lenses

(I always myself use Wray's Platystigmat), if only two, let their focal lengths be 3 inches and 5 inches; if you have three, then choose one of 3 inch, another of 4½ inch and another of 6 inch focal length. You will be able to use what we call the back combination of each of your lenses alone, the focal length is then doubled, so that if you get the two lenses I recommend you will be able to get focal lengths of 3, 5, 6, 10 inches, and with the other set 3, 4½, 6, 9, 12 inches. Cameras are generally sold with three double backs, holding six plates, but I like to have at least six double backs holding twelve plates; sometimes I carry as many as twelve, holding twenty-four plates. You can begin with three backs and add to them from time to time. A larger number is a convenience sometimes; when I am away from home I like, in the evening at the hotel, to load up all my backs, then I have nothing to do next day but to expose my plates, and when one is working with a view to get lecture slides there is scope for many exposures, especially on detail work. When you have obtained your apparatus, come and spend two or three days with me, and I will give you a few practical lessons; in a month's time, if you work steadily and send your negatives, successful and unsuccessful alike, to me for criticism, you ought to be able to turn out technically perfect work. Then I propose that we should, as the spring comes on and the light is better and days are longer, go to some cathedral (Wells, shall we say?) for a good day's work. After that you will be able to work alone. Later in the year you must bring some of your negatives, from which you can print lantern slides, then you will be able to get a set or two ready for the winter, and be able to make your debut as a lecturer before Christmas. What do you say to this?--Yours sincerely, T.P."

In answer to this in due course came a postcard:—

"January 15th.

"I have bought a Sanderson quarter-plate camera like yours, a 3 inch and a 5 inch Wray platystigmat, and am now ready, at your convenience, to pay you a visit and receive the promised instruction. Will you get me a supply of the necessary plates and chemicals?—F.C."

A few days after this, my friend arrived. I had by me a good stock of the plates I generally use, Gem "Universal" and "Meteors," and showed F.C. how to concoct my favourite developer. I dissolved 1 ounce of metabisulphate of potash in 6 ounces of warm soft water, and when the solution was complete poured it into an ounce of pyro, and then made the mixture up to 9 ounces by adding water. We then paid a visit to the kitchen, and laid our hands on 3 ounces of washing soda, and dissolved it in a pint of warm water; an ounce of bromide of potassium was then dissolved in water and made up to 9 ounces of solution.

"You will see," said I, "that to get approximately, one grain of pyro or one grain of bromide, we must take 10 minims of the respective solutions." For a properly exposed quarter-plate I took 20 minims of the pyro solution 2 drams of the soda, and made the mixture up to 1 ounce.

I exposed about a dozen plates on various subjects, some purposely being under, some over, timed, and showed my pupil the method of developing them. The next day I left my pupil to his own devices, and went away from home for the day; when I returned I found some fairly good negatives, all his own work. My friend then left me and worked at home diligently, sending me negatives every now and again for criticism. This correspondence I need not reproduce. When the bright sunny days of the early part of April came, I sent a letter fixing a day for our projected expedition to Wells.

He came the evening before so that we might make an early start next morning. We loaded his three and my twelve backs, which would all fit his camera, and I stuck strips of black paper on the focussing screen of his camera, leaving a central space of 3 inches square, so that he might see the utmost of the subject that he could show on the lantern slide. We packed up all we should want, namely one camera, 15 backs, two lenses, one tripod, the shutter and focussing cloth, putting the smaller things into two light bags, and after supper and a pipe went to bed at 10 o'clock, as we had to walk over a lofty ridge of downland to catch a train which

started about 8 o'clock from Shillingstone, a station three miles off.

We slept and were up and ready for a 6 o'clock breakfast, during which F.C. told me how he had dreamed of developing his glass plates which behaved in a queer way in the dish, doubling themselves up and breaking themselves in two, despite all he could do to keep them flat. When we set forth for our walk in the delightfully fresh morning air, there was not a cloud in the sky. This was as it should be for the work we had in hand, for our object was to get all our thirty plates exposed, and though a clear cloudless day is the worst possible for landscape photography, since clouds and haze are the making of such pictures, yet such a day is very suitable for architectural work. The contrast of light and shade is required to give relief to the carving as well as the main features of the building.

We arrived at Wells at 11.14, and I said, "We must get some general views, and first, before the sun gets too far round, we will take a photograph of the market place with the cathedral rising above the picturesque buildings to the south of the close, the western faces of the three towers will be in shadow while the sun is shining on the southward facing parts of the building; let us get as far back as possible and use the 5 inch focus lens with full aperature and then turn the iris down till all seems sufficiently sharp; *f*-11 will probably be small enough, but to make sure we will try *f*-16, and since we are using Meteor plates marked 280 let us set the shutter to its slowest speed 1-10 sec."

"Done, that will be all right. Now we will spend half an hour in looking thoroughly round the building both outside and inside, and selecting spots for our exposures." This we did, and I pointed out that generally the most pleasing subjects were those in which the lens was not pointed paralled to the walls of the building. Yet for lecture purposes general views must be included. "First arises the question, how shall we deal with the nave looking eastwards? Don't place the camera exactly at the centre of the western wall so that the two sides of the nave look exactly alike, nor on the other hand far from the centre, or the pillars on one side will be utterly out of proportion to those on the other, and the backs of the nave chairs will form a horizontal line right across the plate, but let us place the camera about one third of the distance between the centre and the south main arcading and turn it a little to the north. Stop down only so far as necessary to get good sharp definition, having previously focussed some object in the middle distance. It is absurd to use a lens, that will give all the sharpness required if stopped down to *f*-11 with a stop of *f*-32. For by stopping down the exposure is much increased and moreover flatness will be introduced, a little difference of focus in the immediate foreground and extreme distance will give a much more natural effect.

"In almost any cruciform church a pleasing view may generally be got from the transept about midway between the centre and the north or south end of the transept looking crossways into the nave.

"One common mistake in architectural interior work is over-exposure. I generally find on a bright day, except in the case of very dark buildings, about 1 minute's exposure ample with *f*-11 or *f*-16.

"Much the same principles of choice of positions obtain in the choir as in the nave. It is well to just get the whole of a pillar included on the side of the plate, and never to cut off the bases of the pillars or the points of the arches, you can generally manage this by using a lens of shorter focal length if the longer one will not take in the whole."

"At Wells there are some very interesting capitals, especially in the transept; to get these of sufficient size it will be necessary to take off the front lens of the doublet, and use the back lens only. You will have to use the rising front to its full extent, and bring the focussing screen into a vertical position by using the swing back. The removal of the front lens will decrease the aperture at which the lens is working, for the actual size of the aperture remains the same, but the focal length is doubled, so that if the Iris is set at *f*-8 or *f*-11, the half lens will be really working at *f*-16 or *f*-22 respectively, and thus the needful exposure will be quadrupled. The swinging of the back will throw the top and bottom of the subject out of focus, if you have focussed the middle accurately,

and to secure sharpness all over you will have to stop the lens down a bit. You will find many bits of detail to photograph. You will have in many cases to lower the camera by using the sliding legs of the tripod. To prevent the feet of the tripod slipping, we will place them in the joints between the stones or tiles of the flooring, or put some of those kneeling mats under them, or steady the legs by placing chairs against them. Here at Wells the stairs leading to the Chapter House form a beautiful subject, and also the Chapter House itself. When we have done due justice to these we will go into the undercroft or crypt as it is sometimes called, it will be an admirable example for you of a badly lighted interior. Here you will find some difficulty in focussing, but I will hold an envelope for you to focus on, and light a wax match as soon as I see your head under the cloth, with this I will light up the envelope, now be quick, and get that object quite sharp. Now I will light another match and slowly carry it to the left; call out 'Stop' as soon as its image gets to the side of the ground glass. Now take your head from under the cloth and see how much of the crypt you have got in on that side. Another lighted match carried to the right will show you how much you get in on that side. Will that do?" "Yes." "Well now for the exposure. Set your Iris to *f*-11, and give five minutes." . . . "Now that the five minutes are up, very carefully turn the Iris down to *f*-16, and give another five minutes, I think that will be right. The first five minutes will get a good deal of the exposure done, and the second five minutes will sharpen up the detail."

After this exposure had been made, I said, "By this time the sun will have got round to the south or a little beyond it, and will be shining sideways on the west front, just what we want. We must get a general view, and will go as far off as possible so as to get the central tower showing well above the gable, we won't get quite straight in front, but a little bit to the south. Try your five inch lens. Oh, the image is too small, then unscrew the front combination and use the back one alone; you won't find any distortion, I think, as you are using such a narrow angle, about nineteen degrees."

"Now we will go into the Bishop's garden to get the very pretty view from the south east looking over the pond fed by the springs which have given the name of Wells to the city.

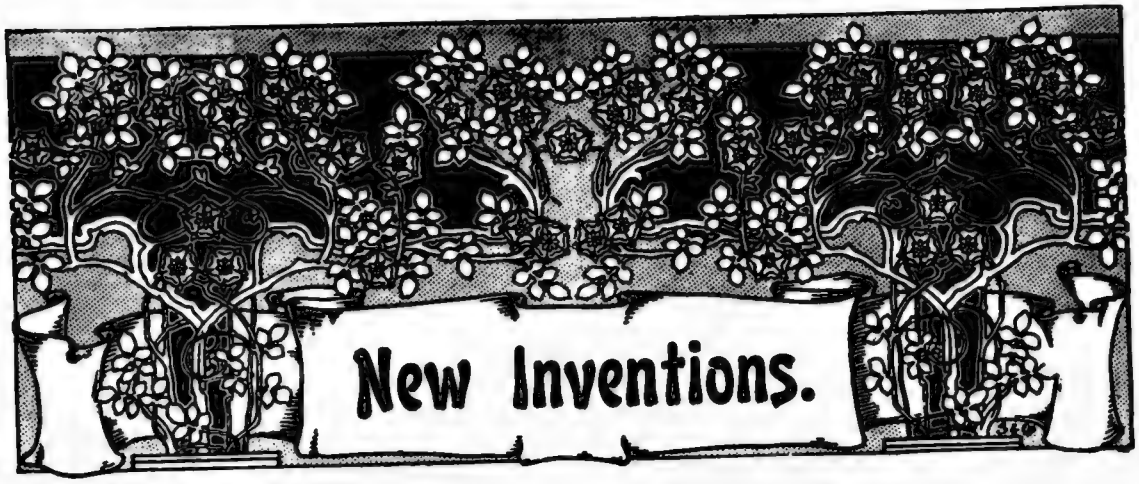
"Next we will return to the west front and get some negatives of the details of the 13th century statuary standing in the niches of this unique western front or screen. You had better use your lens in the same way as when you were getting the general view of the west front. A telephoto lens is the ideal one for this work, yet by means of the rising front and the swing back you will be able to make negatives, and from them slides, that will show up well on the projection screen. You will not have plates or time enough in one day to do full justice to the carving, but if you select carefully you may have sufficient examples to illustrate your lecture. We must not neglect the west door though it is as you see mean looking when compared with the western portals of the French gothic cathedrals.

"Now where will you place your camera for this, on one side? No, for doors are meant to be seen from the front, and a doorway taken much on one side has a hump-shouldered appearance, the nearer side of the archway seems as high or even sometimes higher than the vertex. Take a doorway straight in front or at any rate only slightly from the side.

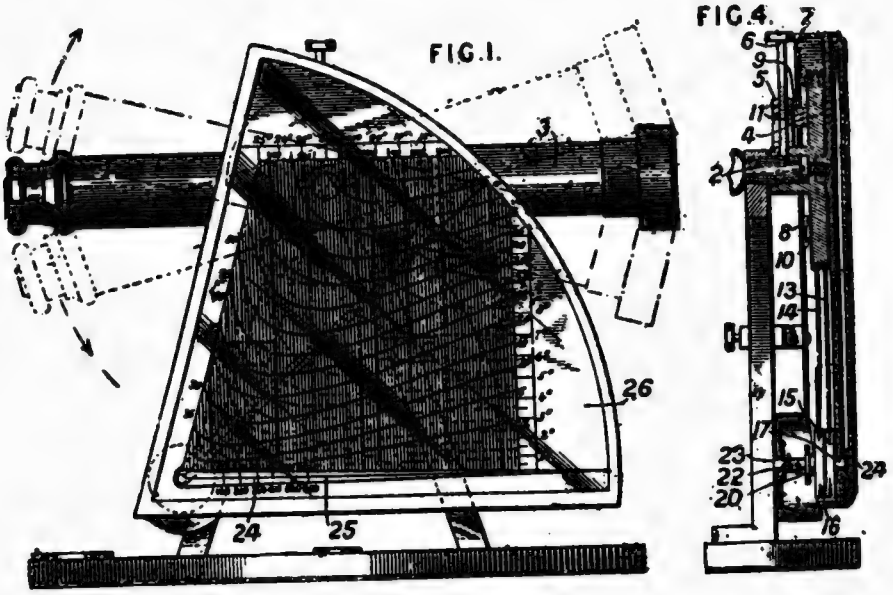
"The north porch, the chief entrance in mediæval times, is splendid and the arcading within it must be photographed.

"We have still a few plates left, and we will use them on the Chain Bridge and the unique Vicar's Close.

"Well, now the last of our 30 plates is exposed, let us have some tea, which we well deserve after our work, and then to the railway station and 'home along,' as we Wessex folk say. I dare say we may be able to develop some plates to-night, and the rest to-morrow, then before you leave Turnworth Rectory we will have another day at Wells: we may want to do some of the views over again, anyhow there is work enough for another long day such as we have just had, and you will then have between four and five dozen negatives, sufficient to enable you to prepare a lecture when the lantern season comes round again."



Specially compiled for "THE OPTICAL LANTERN" by Messrs. Hughes & Young, Patent Agents, 55/56, Chancery Lane, London, W.C., and 38, Ship Street, Brighton, who will give advice and assistance free to our readers on all matters relating to the patenting of inventions.

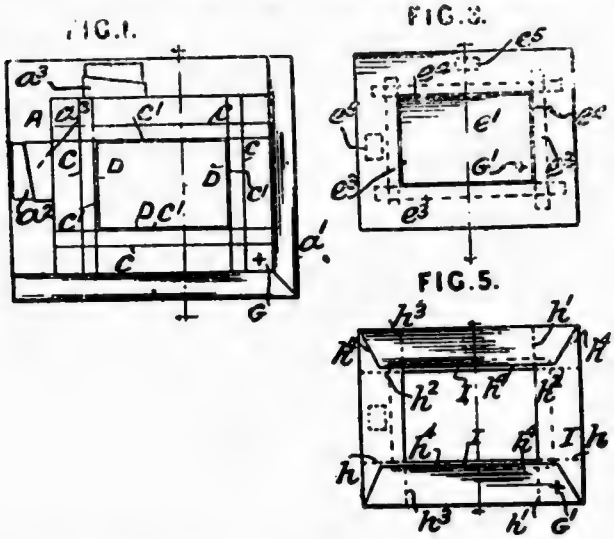


No. 14143. Surveying Instruments. Patentee E. R. ARMSTRONG, 275, Main Street, Beaumont, Texas, U.S.A.

Theodolites; telemeters.—Relating to a surveying or like instrument in which a telescope is used in the measurement of distances and angles, means being provided for reading the altitudes and corrected distances in an instrument of this kind in which the telescope has a pair of horizontal cross-hairs to enable readings to be taken on a staff. The telescope 3 is mounted on a shaft 2 to which a pulley 4 is secured by a bracket 5 and a screw 6. The pulley 4 is grooved and connected by belts 13, 14, one of which is crossed, to pulleys 15, 16 riding loose on a shaft 17 carrying an indicating-pointer 24. The belts may be secured to the pulleys by screws. The shaft 17 is operated by the action on an arm 22 of lugs 20 carried by the pulleys 15, 16, the pointer being returned to zero by a spring 23 and its movement being limited by lugs 8, 9, 10, 11 on the casing 7, the bracket 5, and the pulley 4. The pointer 24 is preferably made of transparent material, such as glass, and has a central line or slot 25 to enable readings to be taken on a chart 26 preferably having a glass or other transparent protective covering. The chart has three sets of lines to indicate respectively the distances read on the staff, the distances corrected for the inclination of the telescope, and the corresponding altitudes. The inclination of the telescope is read along the outer edge of the chart.

No. 13774. Photography. Patentee F. C. WHITE, 838, Unity Buildings, 79, Dearborn Street, Chicago, Illinois, U.S.A.

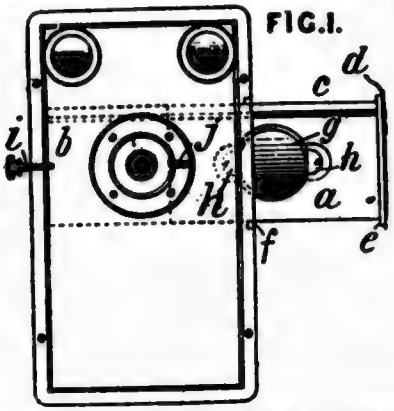
Masks and Masking.—An apparatus for facilitating the construction of masks and gauges for use in printing, particularly from film negatives, allows the use of paper cut to a larger size than the film, and the production of a border of determined width around the picture. A templet A, Fig. 1, is provided with rails a^1 along two sides, fixed wedge-shaped pieces a^2, and lines c, c^1 to correspond with the different sizes of films or plates and lines D. A glass plate is held firmly on the templet by means of the wedges a^3, and on it a piece of opaque paper is gummed and cut down to the lines on the templet. Strips e^3, Fig. 3, are then attached so as to leave a space e^4 between them and the central part e^1. The marks G, G^1, and a similar mark on the printing-frame are for the purpose of indicating their proper



relative positions. Lugs e^5 are fastened to the other side of the glass plate to engage with the edges of the opening in the front of the printing-frame. The film holder and gauge shown in Fig. 5 is then constructed in a similar manner, strips h, h^1, h^2, h^3 being gummed in place to correspond with the lines c^1 on the templet, leaving the central part clear. The flaps h^4 of paper or thin card are then gummed over the others, the edges of the flaps holding the film I in position. The sensitive paper is placed in the printing-frame and exposed first behind the mask (Fig. 3) to print the border, and afterwards behind the film and holder. An ordinary printing-frame is used, but pieces of card or other material are placed on the removable back to compensate for the thickness of the flaps h^4 of the film holder.

No. 14590. Photography. Patentee A. S. SPRATT, Tudor Works, Tudor Road, Hackney, London.

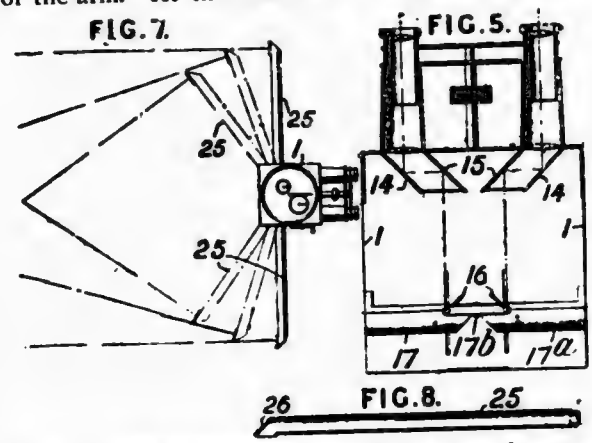
Cameras; lens fittings.—To facilitate cleaning the lens without opening the front of a hand-camera, the lens is mounted in a block of wood or other material which slides in grooves. Fig. 1 shows the front of the camera with the block a partially withdrawn. The lens g and the holding-down plates h are sunk below the surface of the block a. A guiding-strip b



fixed to the front of the camera, engages in the channel c cut in the block a. The block a is held in position when pushed home by the screw i engaging the nut j, and the joint at the side of the camera is made light-tight by the flange e entering the recess f, and the plate d covers the joint so made. The block may enter the camera from either side or from the top or bottom.

14587. Range Finders. Patentee J. G. Stewart, 9, Archdell Street, Pietermaritsburg, Natal, South Africa.

Fig. 5 shows the instrument in section; fig. 7 is a plan on a smaller scale, and fig. 8 a detail. A casing 1 is fitted with two arms 25 fitted in sockets 17, 17^a, which are pivotted at 17^b. Each arm 25 carries at its other end a mirror 26 mounted at 45° to the axis of the arm. At the inner end of each arm, a second



mirror 16 is mounted to direct the light as shown on to parallel mirrors 14, 15, and thence to one member of a binocular observing-telescope. By suitable spur gearing, the two arms 25 are rotated about the axis 17 until, as shown by fig. 7, rays from the distant object strike the mirrors 26 and are reflected along the axis of the arms. The necessary rotation of the arms to effect this adjustment is transmitted by spur gearing to a pointer which indicates on a dial the range of the object under observation.

THE OPTICAL PRINCIPLE OF A LANTERN.

By J. Hay Taylor.

IN the olden days of the lantern, or as it was termed Magic Lantern, the instrument was of a very different type compared with the modern apparatus used for optical projection. The following somewhat humorous definition appears in an ancient dictionary: "The magic lantern is a small optical instrument which shows, by a gloomy light on a wall, monsters so hideous that those who are ignorant of the secret believe it to be performed by magic." This definition might have been all very well in the olden times before the general spread of education, but nowadays, when speaking about optical projection, a better definition is required. Thus, a magnified image of any picture or phenomenon, when thrown on a screen by means of an illuminant and lenses, is termed a projection.

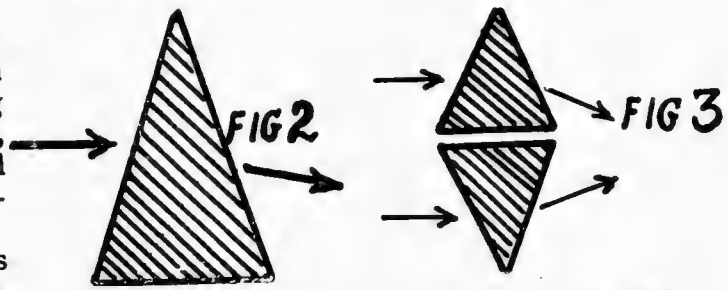
FIG 1

The following sectional diagram (Fig. 1) illustrates the general optical system by which projection is carried out, A being the illuminant, B condenser, C objective, and to which attention will again be called after some of the details have been considered.

Light, unless intercepted, always travels in straight lines, and, as will be seen at A in the first part of the diagram, radiates in straight lines from its source. This holds good, no matter the nature of th source of illumination, whether oil, limelight, or electric light.

What is required for the purposes of optical projection is to collect a large angle of these rays, transmit them through the slide, and pass them on to the projecting objective, by means of which a large image is brought to a focus on a screen placed at some distance beyond.

If we intercept a ray of light by allowing it to fall upon a glass prism as shown in Fig. 2, it ceases to travel in a straight line, but becomes deflected towards the thicker part of the prism, and continues its course as shown. Place two prisms together as in Fig. 3, and we have the rudiments of a lens, or what is generally known as such.



There are few persons who are not familiar with the shape of a burning glass,

a lens of which an exaggerated sectional illustration will be seen in Fig. 4. If such

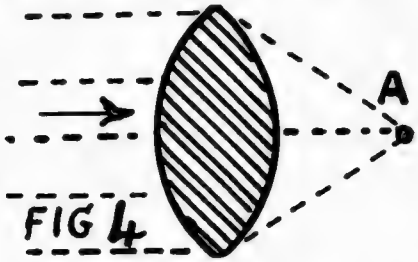


FIG 4

a lens be held towards the sun and moved to and from (say) the back of the hand until only a small circle of light is formed, the user will be suddenly made aware of a burning sensation caused by the rays being brought to a connecting point, which point is known as the solar focus (A),

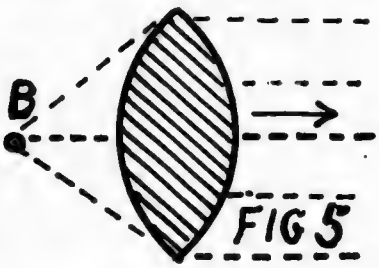


FIG 5

And if the distance from this point to the lens itself is three inches, we speak of this particular lens as possessing a solar focus of three inches. If with the same lens we reverse matters and hold it at three inches from any illuminant as B, in Fig. 5, the rays strike the glass at an angle and pass away from it somewhat parallel.

Let us now apply this knowledge to the lantern, but before doing so will place a lantern slide in front of an illuminant, when it will be seen that, although some of the rays will reach the objective or image forming lenses in Fig. 6, it will be obvious that only a small portion of the rays will do so. And these even in a direction of no use for the purpose of projection, whilst the others pass off at the sides.

Our burning glass experiment showed that by its aid the rays of light could be bent or deflected, so as to leave the glass in a somewhat parallel direction when the illuminant was placed away from it at the distance of its solar focus. Even now, if we use this knowledge in conjunction with our slide it will not help us very much,

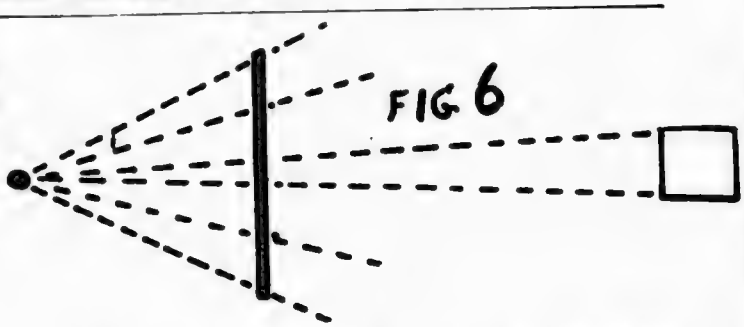


FIG 6

for only the bundle of rays of the same diameter as the objective would reach it as in Fig. 7; but there is a method by

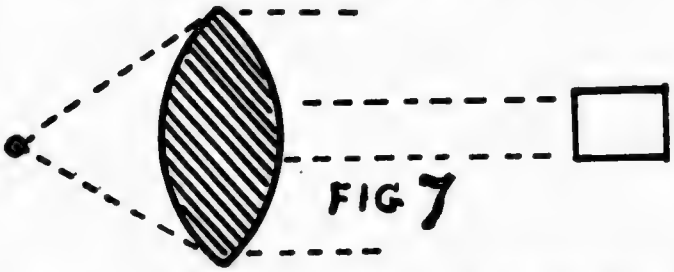


FIG 7

which the rays can be bent to almost any desired angle, namely, by placing the illuminant at a closer or greater distance, thus if, as in Fig. 8, we place it at a greater distance away than the solar focus of the lens, the rays after passing the lens are no longer parallel, but come somewhat to a point at some distance off.

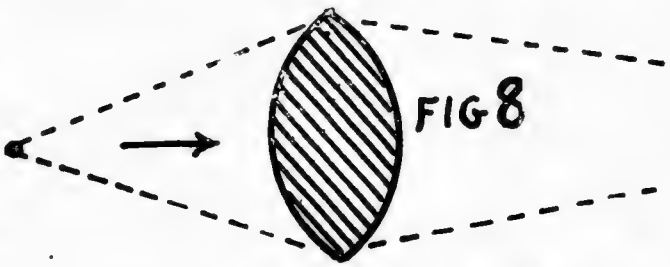


FIG 8

The two points at either side of the lens where the rays meet are known as the conjugate foci. These two points have a definite relationship which can the better be explained if the rays, falling near the margin of the lens, be likened to a hinged foot rule bent to an angle of about 150 degrees pivotted at the angle on the edge of the lens as in figure 9 where, for the sake of better describing the subject, two rules are shown. These show by means of the differently formed lines where the relative conjugate foci will be if the illuminant was placed at various distances, and it will be noticed that as one point recedes from the lens the other advances towards

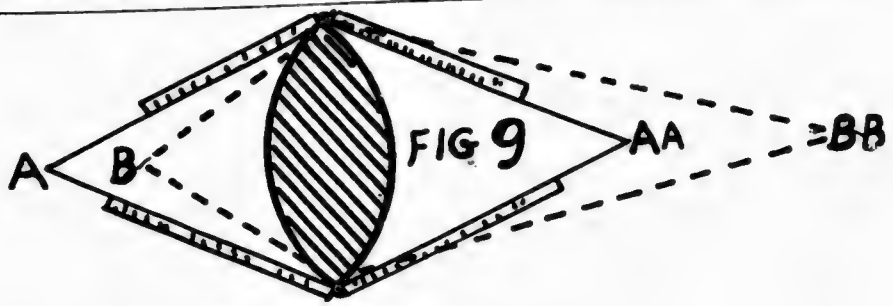


FIG 9

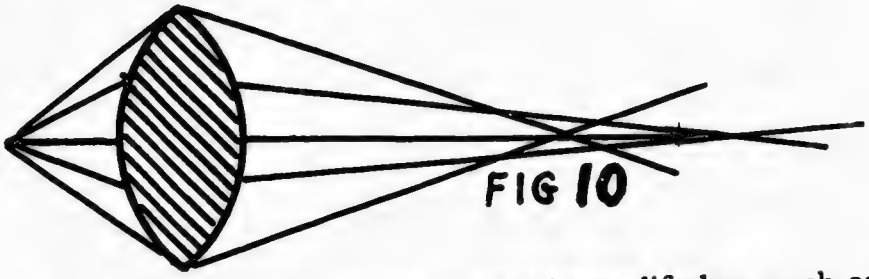


FIG 10

it. This will be the clearer understood when it is remembered that the angle of the foot rule is a permanency, and that if a lighted candle be placed at A its inverted image would be focussed on a screen if held at A A, and the same would apply in the case of B and its counterpart B B. It is important that the details relative to conjugate foci be understood, for it is upon this principle that all optical systems work.

The form of lens spoken of so far has been one known as double convex, and although this form was perhaps the best to illustrate the principle, one of slightly different construction is required to collect the rays from the illuminant and pass them through the lantern slide on to the objective. To collect the necessary angle of light would entail a lens of short focus, and this demands that the centre of the lens must be very thick, so that not only would there be great danger of the heat from the illuminant cracking it, but another defect comes into play, viz., spherical aberration, which means that the rays passing through the margin of the lens come to a slightly shorter focus than those passing more towards its centre, as shown in fig. 10. For the purpose of proper optical projection it is necessary that this difference in the meeting of the rays be modified as much as possible, and as far as ordinary lantern work is concerned the modification answers its purpose.

Imagine, therefore, this single lens split down its centre and the two flat sides placed in a brass cell or mount after the

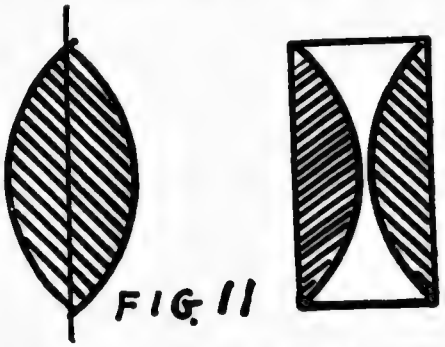


FIG 11

style of fig. 11, and we greatly lessen the spherical aberration and diminish the likelihood of cracking which the otherwise great thickness of the glass would entail.

There are other forms of condensers in use, but for all general purposes of slide projection the plano-convex condenser, fig. 11, answers most purposes, especially when the illuminant is somewhat large, as instanced by the oil lamp or incandescent gas.

To be continued.

Round and About.

The Chiswick Camera Club

Held their tenth annual exhibition at the Chiswick Town Hall, on Monday and Tuesday (April 16th and 17th). There was a large audience on both days. In addition to the exhibition proper, prize lantern slides and kinematograph entertainments were given.

The Benefits of Seaside Camps

For London working boys are not understood by a good many, so in order to further popularise them Mr. Able Bloxam, the commandant and secretary, has prepared some excellent slides showing pictures of the life under canvas. These he will be pleased to show at boys' clubs, etc. His address is 23, Northumberland Avenue.

Morocco.

Mr. C. Rider Noble's lecture on Morocco, at the Blenheim Club, was illustrated by means of an entirely new kinematograph apparatus, inaugurating what Mr. Martin Duncan described as a new era in kinematography. By means of the new apparatus (which has just been brought out by a Shaftesbury Avenue firm) the moving film can be stopped at any moment, so that any particular phase of the series of photographs which make up the moving picture can be examined at leisure.

The Prize Competition,

Advertised by the Internationale Kinematographen Co. on another page, should attract any of our readers who have original notions which they think would make good subjects for living picture films. At various times we have received suggestions which would doubtless have been useful had we been in the trade. A market for these is now opened by our enterprising German friends, who doubtless will receive a ready response to their offer.

Colour Photography.

With the help of lantern illustrations Mr. F. Enock gave an admirable lecture on colour photography before the Royal Horticultural Society, last month. Mr. Enock briefly explained the technicalities of colour photography, and threw on the screen a number of examples. The first series of slides was illustrative of caterpillars, cocoons, and moths. The next series showed flowers, landscapes, and sunsets.

Mr. Burton Holmes

Was, we believe, at Naples during the recent eruption of Vesuvius, and we understand it is probable that some excellent films will be the result.

Japan Society.

An interesting paper on "Pilgrims to Isé" was read by Mr. J. Morris, M.J.S., at the last meeting of the Japan Society. It was illustrated by lantern slides, shown through the epidiascope, a notable feature introduced being photographs of the scenery on the banks of the Oigawa river and at Hamana Inlet, taken by the lecturer in the interior of Japan thirty years ago, long prior to the spread of railway communication, when travelling was restricted, and before dry plates had reached that part of the world, when a camera in that part of the country was something of a curiosity.

A New Catalogue

Which should be in the hands of everyone interested in the trade is that of Machines and Assessories just published by the Chas. Urban Trading Co., Limited. Marvellous are the new goods listed therein. Cameras and Projectors to suit all pockets, and improved appliances which cannot but add perfection in both the taking and projection of living pictures. Not content with stating dry facts there is much useful advice and information for the benefit of both amateur and professional. Those who desire to be *au fait* with invention up to date should write for a copy.

"The Opening of Flowers,"

Was the title of the instructive and interesting lecture, delivered by Mrs. D. H. Scott, at the Royal Horticultural Society's meeting last month, It was accompanied by animated photographs of plants by means of the Kammatograph, taken every quarter of an hour during many successive days—so that the audience were able to see the movements of the plants photographed. Among the new pictures shown was a bud of sycamore, taken during three weeks, showing the opening of two buds until the leaves were exposed. There was also a new film of fuchsia, showing a bud (taken during sixteen days) opening; the stamens grow in length, discharge their pollen, the stigma grows through, and eventually the corolla, and then the flower falls off, and when the film comes to an end the fruit is seen.

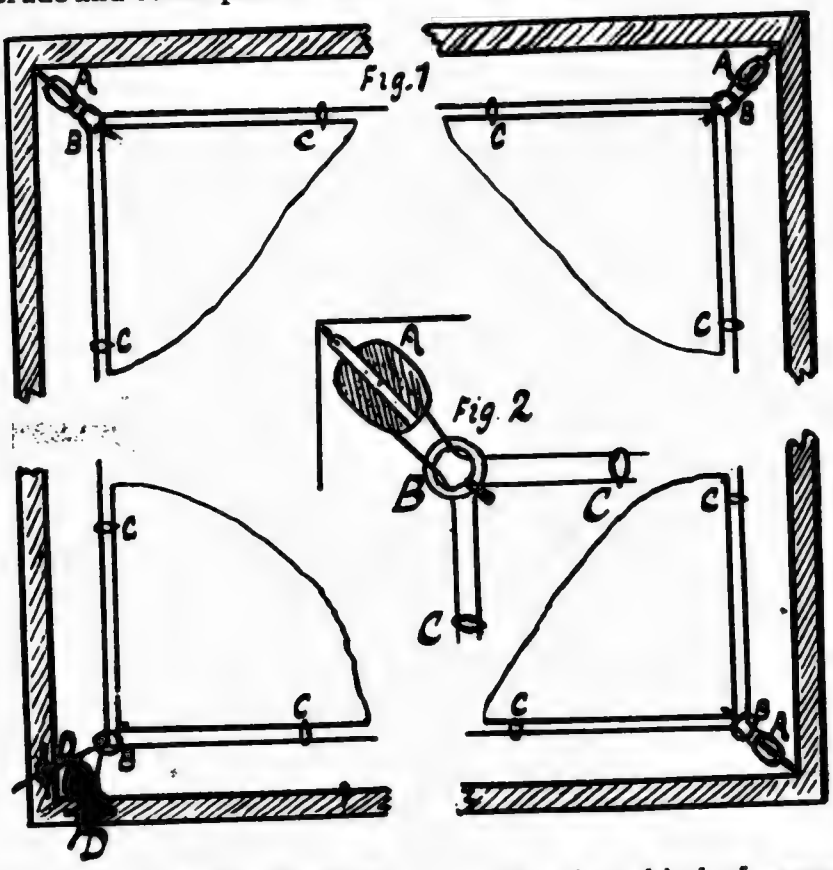
Dust Troubles.

It used to be said of the albumen process of lantern slide-making that dust was so great an enemy that the real enthusiasts used to remove their clothes and give themselves a coat of glycerine all over as a preventive of dust spots, and in this airy but adhesive garb, which must have been very suggestive of the ancient Greek athletes, they conducted the necessary dark-room operations. We do not vouch for the truth of the legend, but we may be thankful that modern photography does not make such demands upon us. "Winter troubles" would have a new and deeper significance if they did. At the same time, we need not go to the other extreme, and allow dust to accumulate on the camera and in the dark room. Chemical dust in the latter may give rise to a great deal of trouble, which is better avoided by strict cleanliness. The shelves of which bottles are stored in particular should come in for attention. Some excellent negatives were shown us the other day, excellent that is with one exception—they were completely ruined by chemical dust, which had fallen on the film while still wet. Each spot on which the dust fell was black, while a dark ring some eighth of an inch in diameter marked the distance to which the impurity travelled in the moist film.—*Photography.*

SCREENS FOR THE PROJECTION OF PICTURES.

By J. Hay Taylor.

At one time, almost anything was considered good enough to use for the projection of lantern pictures, but, of course, that was in the days of, more or less, crude and comic pictures—



if the long growing nose of the projected figure happened to become somewhat distorted owing to the creases on the screen it was considered no detriment, but only served to heighten the effect. Now, however, we can get good and artistic pictures, and it becomes us to project them with all the art possible. It will thus be evident that the purer, flatter, and more opaque the screen is, the better will the projected results be.

The best kind of screen, unfortunately, cannot be employed in general use, but there is no reason why, in institutions where the lantern is frequently used, such cannot be specially prepared, and proper attention paid to keep it in good order.

In buildings such as we have alluded to, the highest order of screen would be of the following style, viz., the wall of the hall or building carefully gone over with a coating of "hard finish," or in other words a thin skim coating of plaster of Paris should be laid over the selected portion of the ordinary plaster.

In the case of a building in course of erection, it would be well to leave that part of the wall where the screen is to be, with a rebate of about a couple of inches, so that the finished screen would set back from the ordinary line of the wall a little, this will allow of a dust blind to be lowered, and yet not rub against the screen. If, however, as would be the case in most instances, the building be already to hand, then that portion of the wall decided upon as the screen could be prepared as mentioned, and a moulding of about a couple of inches nailed around it *a la frame*, and a dust blind fitted to that.

It has often been suggested that lantern screens should be surrounded with a kind of coloured proscenium, but for educational purposes this would be quite out of place; we do not see the margins of blackboards so ornamented.

Lucky, indeed, is the travelling entertainer, who finds already to hand a permanent screen in the building where he is to operate, for much time and anxiety would be saved. This, however, being the exception, it behoves him to carry along his screen and fittings as part of his lantern impedimenta; if this consist of a screen on rollers it does not form a very convenient package, and if the screen is of the sheet pattern, a bamboo or other frame has to be taken too.

Speaking of frames for a moment, it can only be supposed that it is for a matter of lightness that the bamboo-fishing-rod-kind-of-affair still holds sway. Unfortunately by many it is considered the proper thing, and makers are fond of advertising that their particular form of frame is suitable for a screen either, so to speak, the size of a pocket handkerchief, or the mainsail of a full-rigged ship. Speaking from experience, the strength of many of these frames is well suited to the handkerchief size, but when it comes to large or even moderate sized screens, the wobbling element speedily comes into play. The frame is put together in jointed rods of about three feet long, laid flat on the floor and the screen tied all round. In that position it looks all that can be desired; unfortunately, however, to be of use, it must be reared on end, and then the trouble begins; it wobbles about like a blanc mange, all hands have to be requisitioned in order to steady it, and finally, when it is balanced on end, it is found that the top rod has sagged somewhat in the middle and a nasty crease in the screen is the result. This must be remedied, down must come the frame again, and so the unhappy performance goes on until at last things have been arranged to a somewhat satisfactory degree. Advice has been given to procure a long ladder and to suspend the frame so as to remove the sag, also to throw a rope over one of the beams and pull it up, &c., but unfortunately neither the ladders nor beams are to be found when desired.

Even at the expense of weight, we must have a rigid frame, one capable of sustaining a reasonable strain, and the finishing touches relative to the straining of the screen should be attended to after everything is up and in position.

A convenient means of doing this was sometime ago suggested by an American gentleman, and will be readily understood from the sketch. Without going into the details of the frame corner fastenings, which of course must be strong, it will be seen that at three corners of the frame a block or pulley is hooked on. At each corner of the screen is sewed a large strong iron ring (B), whilst at intervals along the edges are also secured stout rings (C) of smaller dimensions. At the lower end of the frame two cleats (D) are attached. Whilst on the ground the ropes can be threaded through the rings and pulleys as shown (the corners will be better understood on reference to fig. 2).

When everything is up and in position, the further tightening of the ends of the rope at the cleats (D D) will render the screen perfectly taut. It will be apparent that the rope and not the frame takes the pull at the edges of the screen, and that if one end of the rope be pulled, all parts are rendered equally taut.

CHRIST BEFORE CAIAPHAS.—GAUMONT'S NEW SUCCESS.

THE MONTH'S NEW FILMS.

THE fates were certainly kind to Mr. Bromhead, the manager of Messrs. Gaumont & Co., in giving him the opportunity of obtaining pictures of Vesuvius in eruption just prior to the dreadful disturbance which recently occurred. Mr. Bromhead was in Italy on business, and, of course, had not received word from the interior regions that anything special was about to happen. He heard, however, that the crater was particularly lively, and in his usual enterprising manner detected the subject for a good film. He had his camera with him ready for emergency, and determined on visiting the spot. He took the train up as far as possible, but as the molten lava ran across the track of the Funicular Railway, he chartered a pony and a guide who spoke French, and got up to the ring of the old crater. This was a dangerous proceeding, as after events proved, for this spot had only a thin crust, which since the catastrophe has dropped 850 feet. Of course, he had trouble with the police, who tried to persuade him from doing what to them was foolhardiness, but those who know Mr. Bromhead will understand that this only enticed him to greater efforts, and after promising them that, should the wind change or the eruption become too violent he would run for his life and leave his camera, they allowed him to proceed, but instead of running from the camera, directly he got among the falling ashes and in dangerous proximity to the streams of molten lava issuing from the fissures, he turned the handle for dear life, and obtained one of the most novel sets of pictures that have ever been taken. He was fortunate also to obtain views of Pompeii, Sorento, and the Capri districts, which, were practically wiped out of existence after the violent eruption. He left Italy on the Thursday without any knowledge that before two days had elapsed the whole region would be devastated and ruined. Perhaps it is just as well he had no premonition that such would happen, for it is more than probable he would have sacrificed everything for the sake of a special film. Not anticipating trouble, however, he returned to London, and was surprised to hear how great a calamity had happened directly he had left. Although exceedingly busy with other matters the film was speedily developed, and has proved a big attraction wherever shown.

WE have repeatedly urged the need of films specially for Church entertainments and of a scriptural nature, and now find that a Paris house has produced a film of 2,150 feet entitled "Christ among Men," which should prove of great use at certain classes of lectures and services. There is the ring of true religious feeling in the whole of the tableaux, among which are: Scenes depicting Bethlehem, the Wise Men, Raising Jairus' Daughter, Entering Jerusalem, the Last Supper, the Garden of Olives, the Disciples Asleep, the Betrayal and Arrest of Jesus, Jesus before Caiaphas, Peter's Denial, Jesus before Pilate, the Scourging, Ecce Homo, Carrying the Cross, the Ascent of Calvary, the Crucifixion, the Agony, the Descent from the Cross, the Burial and Resurrection. It will be interesting to note whether this film will be shown at the Sunday League Meetings. The views we give show some striking tableaux in this film.

ONE of the most successful films of the season has been that of Gaumont's "Missing Legacy or the Story of a Brown Hat." Full of humour in surroundings, and happy incidents which cannot fail to prove great attractions, are also their two films, "The New Woman" and the "Jewel Robbery."

MUCH trouble, expense, and thought has recently been used to reproduce episodes in the life of Dick Turpin. We hear of many curious events from the enterprising actors being over anxious to obtain true local colour and surroundings, but the film is of an astonishingly realistic and stirring character. The Ride shows Dick leaping the toll-gate to the discomfiture of his pursuers, holding up the London to York coach, the narrow escape of Dick Turpin at the Beauchamp Arms, besides a great number of other thrilling escapades. The production, which was under the direction of Lewin Fitzhamon, and entailed some weeks of preparation, necessitated the use of twenty horses, a coach and four, and an extraordinary number of costumes, chiefly supplied by Messrs. Raynes & Co. Black Bess was a superb specimen of the thorough-bred, and all were well mounted, Mr. Cliff Bing shining conspicuously on a spirited animal; while Mr. George Curtis showed that he is as good a jockey at the real thing as he is upon the stage. There were some hairbreadth escapes, such as the bolting of Lawyer Coates's horse, which finally fell on the pavement, nearly smashing a plate-glass window. Major Mowbray's horse also took fright at the extraordinary demonstrations of the crowd, rearing up and falling on its rider.

THE CUP TIE brought thousands from the North, who flooded the London streets and places of amusement. At the latter they were astonished at the pictures showing the match which were exhibited at the Alhambra, Empire, Palace, Coliseum, Hippodrome, Holborn, and Lyceum theatres, and interested the large audiences at these establishments. They were all taken by the Urbanora Company, who had sole rights for reproduction from the Palace authorities.

MR. PAUL produced a good film for Easter entitled "The Fakir and the Footpads." The picture opens with four gentlemen having a convivial supper. One of them, a conjuror, asks the waitress for a silk hat, and proceeds to place the roast chicken, veal and ham pie, a bottle of wine, serviettes, knives and forks and other articles into same, and then doing a magic pass over the top of the hat causes everything to disappear. The friends think this beyond joking, and instantly demand the food back, but the conjuror tells them that is impossible. The friends endeavour to seize him, but he disappears, and, instead of laying their hands on him, they fall upon the chair. The conjuror is quietly proceeding on his way home when two hooligans perceive him. When abreast of the footpads they spring upon him, one presenting a revolver while the other clubs him. They go through his pockets, but to their disgust find nothing. One of them, picking up the conjuror's tall hat, makes a discovery, and pulls out a cloth which turns out to be a damask table cloth, which the other man spreads upon the ground. The former again takes from the hat knives, forks, plates, a roast chicken, a meat pie, and

PETER DENIES CHRIST.

MARY MAGDALENE ANOINTING CHRIST'S FEET.

THE BURIAL OF CHRIST

a bottle of champagne. With great delight they settle down to enjoy a good feed, but no sooner does one of them start to carve the fowl than, to their utter amazement, it jumps up alive. They endeavour to catch it but in vain. Disgusted they return to the bottle of wine, and one holds the bottle while the other tries to draw out the cork. The contents come out with great force, and vainly they endeavour to put their mouths over the neck of the bottle to get a little of the contents, which at each attempt very nearly chokes them. The bottle being empty they turn to the meat pie, which no sooner is touched by the fork held by one of the footpads than it explodes, and the two hooligans are next seen proceeding to the clouds. The conjuror who has regained consciousness gets up, and from nowhere produces a telescope through which he looks, and it shows the hooligans coming down from the clouds tattered and torn. The next view shows them crashing through a greenhouse, from which they emerge in a pitiful condition.

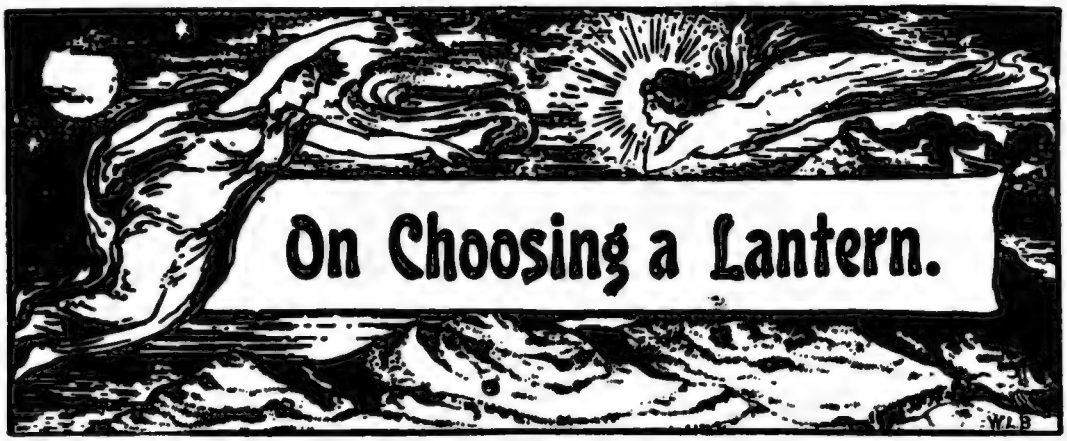
MESSRS. CRICKS AND SHARP are keeping up their reputation for exciting effect in their latest film "The Attack on the Agent," which deals with all the stirring incidents of an Irish eviction. The agent is next shot at by moonlighters and dragged from his car. The driver whips up his horse and brings the agent's wife to the rescue, who arrives in time to save her husband being cut to pieces by an express train. All the incidents are far-fetched and most thrilling.

THE EDISON MANUFACTURING CO. have another film on the market, which bids fair to be among the most popular this firm have produced. The title is "The Dream of a Rarebit Fiend," and the incidents are of a most startling and supernatural nature, and should thrill any kind of audience. We shall give an extended report in our next issue.

THE CHARLES URBAN TRADING CO. have struck another good thing in obtaining the exclusive rights for reproducing the Hackenschmidt and Madrali match at Olympia. We believe this has entailed a very heavy royalty paid to both principals and managers, but this does not embrace the whole of the expense that such an undertaking involves, for the lighting alone is a tremendous item, and to obtain a genuine film right through, without the faking that has been resorted to in many similar productions, will run the cost to between £700 and £1,000.

THIS firm scored a record in their film of the Cup Tie, supplying seven theatres the same evening of the match and sending off 55 films to various provincial houses before 3 o'clock on the Sunday afternoon following the event. A motor was employed to bring the first half to their developing room but with provoking "cussedness" it broke down on the way, and the first half was not received much before the second half of the film, which arrived at 8.15. Thirteen hundred feet of good film were taken by three men, and 400 feet of the film was of the most lively play during a tame game. There were 250 joins in the negative, but the whole makes a beautiful film, which redounds to the credit of the Urban Co.

Two of Urban's best men are at present at Athens, filming the Olympic games, by a concession received from the King of Greece. By the time this journal is in the hands of our readers we expect the films will be shown, and should prove of great interest to English spectators. The topical film "Is Spiritualism a sham?" is certainly an uncanny production, but withall a most interesting development of the *Daily Telegraph* controversy, and another which is full of life is that of the "Travel with a Menagerie through Cornwall." Mr. Urban looks upon a job of this character as recreation, and travelled several days and nights with Bostock and Wombwell's show from Tavistock to Liscard. He obtained some very happy subjects showing the life and adventures of the travelling showmen on the road and in dragging the heavy cages up steep hills



By J. T. Warner.

The writer was recently asked by a friend as to what sort of lantern he would advise him to select, as he thought of going in for that sort of thing. The query is somewhat vague, and as there must be numerous others who also contemplate becoming lanternists either on a small or large scale, it will be a fitting opportunity to make a few remarks upon the subject.

Broadly speaking, there are three types of lanternists, viz., those who use the lantern for domestic edification in the home circle, the user on a semi-public scale, such as Sunday schools, and the professional exhibitor. To each of these departments a different answer would have to be given to such as aspire to occupy these ranks. Let us therefore consider them in their order.

In the domestic sense, it is presumable that the amount of outlay is a consideration, and that it is merely required to project either commercial slides or those taken by members of the family. It is, therefore, likely that a single lantern will answer the purpose.

Nowadays the single lantern has a sale far in advance of either the biunial or triple, and is to be found in stock at most chemists or shops dealing in anything of the slightest scientific nature; when making a selection it must be remembered that at no previous time has such a lot of rubbish ever been offered to the public as is at present done in the form of single lanterns. Of course there is good apparatus to be obtained also, but the other kind is most in evidence. It is not to be supposed that one can get a reliable instrument for less than a pound, yet there are several offered to the public at a few shillings less than this. The buyer must therefore look after himself. There are, however, specialists in this line of business whose reputation depends on the class of lantern they sell, and to whom the buyer would do well to listen; but this does not dispose of the fact that never before has so much rubbish been on the market.

The domestic lantern will, therefore, presumably be a single one. These may be obtained with bodies of tin, Russian iron, and mahogany. The cheapest kind is the tin one with a spun brass part front. Tin has the disadvantage of looking very shabby as soon as the enamel begins to flake off with the heat, hence Russian iron is preferable, as the dark, smooth Russian iron, being free from enamel, there is nothing to chip off, hence they will stand a great heat, yet always look well. In most lanterns, if the lens be drawn outwards away from the body, it will be seen that this is connected to the lantern front by a sliding tube in order to facilitate the placing of the lens or objective at the proper distance from the slide in order to get a correct focus on the screen according to the length of the room or size of image required. Pull this tubing out nearly half way, then take hold of the lens or objective and see if there is much shake; if so, waste no more time examining it, but try another. As a rule the objective on commercial lanterns is possessed of a focus of about six inches, which will, at a distance of ten feet from the screen, project a picture of about five feet in diameter; or if twenty feet away, a picture of about ten feet in diameter. With the same lantern, objectives of longer foci

may be employed and it is then that the necessity of having the draw-tube free from shake is most apparent, for practically speaking the objective requires to be about the distance of its focus from the lantern slide itself.

An oil lamp, incandescent gas, or acetylene, will, under the circumstances, be the form of light used by a beginner. The first is often complained of as being "stinky," but if the outside of the lamp be kept absolutely clean and the wicks nicely trimmed, it forms an admirable illuminant. Several four-wick lamps are on the market, and these will be found to give a light of from 90 to upwards of a hundred candle-power. The dealer will also supply a special gas-burner on a tray to slide in the lantern on which an incandescent mantle can be placed and connected with rubber tubing to the ordinary gas-bracket. The form of condenser with this outfit will doubtless consist of two plano-convex lenses mounted with their convex sides towards each other, this being the best for use with illuminants possessing a large surface.

The Sunday school, or small hall exhibitor will doubtless select a mahogany lantern with a brass front, not that mahogany is better than any other material, but as the apparatus will be seen by the audience, there is a certain amount of pardonable pride in having a certain amount of show. Lanternists have in the past and will in the future be equally pleased to hear someone in the audience say, "Fine-looking instrument, that of Mr. ———; such a contrast to the old-looking affair we had here last time."

In the way of illumination, it is just as well to go in for limelight at once, using either a blow-through jet or a mixed jet. With the former (and simpler) the house gas side can be attached to any gas-bracket, whilst that to the oxygen side must be connected to a cylinder of compressed oxygen, whereas with the mixed jet, which of course will give greater light, both gases are used under compression. Soft variety of limes are used with the first, and hard limes with the second style of jet. With limelight it will be well to use the Herschel form of condenser and about 8-inch focus objectives.

In no case is it to be supposed that one will after procuring his outfit immediately use it in public without first gaining experience, during which time will be ascertained the easiest form of slide carrier to use, the correct mode of using automatic regulators on the cylinders, and the hundred and one other small items which are outside the scope of the present article. Should dissolving views be required occasionally, then a biunial lantern must be procured—this is practically two lanterns fastened one above the other, so that if a slide be placed in each they may be dissolved on the screen by slowly turning up the light of the second lantern, whilst a slide is showing from the first, and then slowly turning down the light in the first. For this purpose two single lanterns can, if desired, be used side by side.

To the aspirant for the professional section much would have to be said, so much so that in order to cover the ground a special series of articles on the subject would have to be written, but he would require a biunial lantern with a cinematographic attachment fitted to the lower lantern. He would require to be equipped with both limelight jets and electric lamp, the latter being convenient for cinematographic work where halls are installed with the electric current. Anyhow, experience would have to be gained ere one should entertain any idea of undertaking a public display, and the best mode of gaining this is as an assistant to a really good operator.

— THE —

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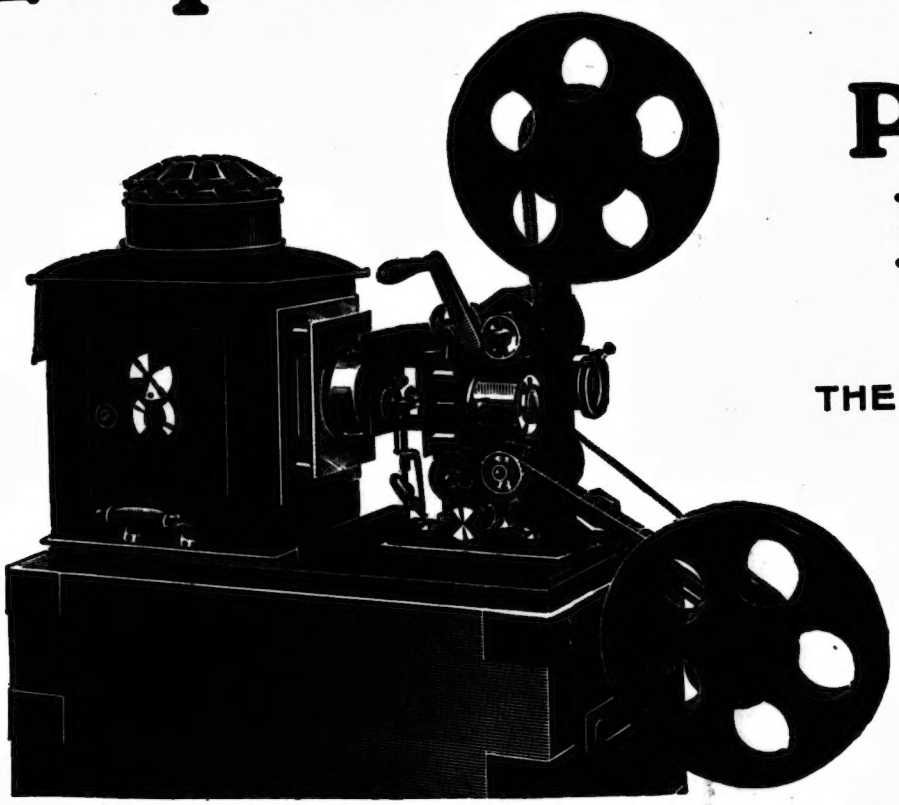

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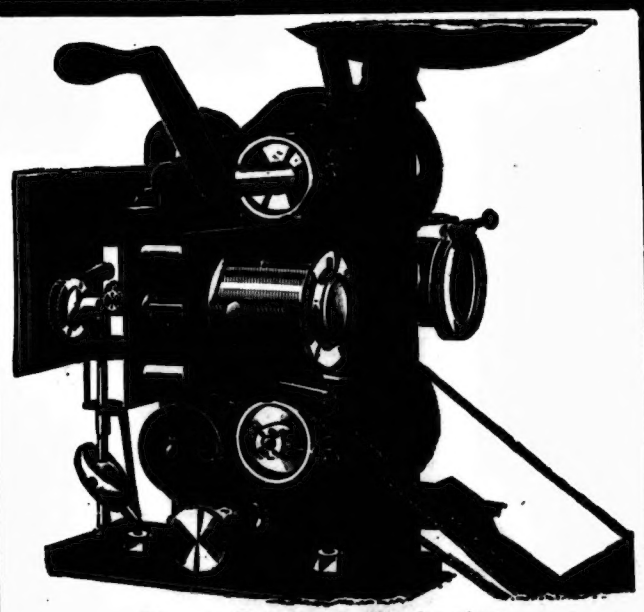

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